TURBINE ENGINE MODULE COMPRISING A CASING AROUND A DEVICE WITH A COVER FOR RECOVERING LUBRICATING OIL

FIELD OF THE INVENTION AND PRIOR ART

The present invention relates to the field of the lubrication of aircraft engines. It relates more particularly to a device for recovering the oil that has been used by a device comprising a rotating portion.

For example, a turboprop engine having contra-rotating propellers may incorporate a power gearbox in an enclosure for lubricating the bearings. Said enclosure is arranged to guide the oil leaving the devices contained in said enclosure towards storage means. Moreover, it is generally in communication with an oil separator of the air present in the oil circuit.

The power gearbox (referred to here as a PGB) requires a very large amount of oil, specifically over half of the total oil flow passing into the lubrication enclosure.

Furthermore, the PGB comprises a rotating gear system. According to the prior art, an annular cover extends around the PGB and is connected to a rotating portion of the PGB for conjoint rotation, in such a way that the cover itself rotates at high speed. The oil which lubricated the PGB exits therefrom at the periphery, through ports in the outer cover of the PGB. The oil passes through said ports by centrifugation and forms a stream which is widely dispersed in rotation and which will splash large amounts on all the walls of the recovery enclosure around the PGB.

Because of the large amount of oil and the dispersion of the splashes, the oil leaving the PGB may pose problems for the recovery thereof towards the means for discharging oil from the enclosure. There is therefore a risk of inadequate discharge, with the danger of oil refilling the enclosure and escaping through the seals and therefore sending oil into firing zones or flooding the PGB.

The object of the present invention is to propose a simple solution for effectively recovering the oil flow leaving a device, in particular a device rotating in a lubrication enclosure.

DISCLOSURE OF THE INVENTION

Accordingly, the invention relates to a turbine engine module comprising a device arranged so that the lubricating oil escapes therefrom by centrifugation about an axis of rotation, said device comprising at least one rotating portion and a cover rigidly connected to said rotating portion, said cover comprising radial through ports for the passage of the oil escaping by centrifugation and means for guiding the oil leaving said ports radially outwards, and a casing defining at least one portion of a lubrication enclosure of said device, said casing comprising at least one gutter, arranged to recover the oil passing through said radial ports and having a substantially annular shape centred on the axis of rotation, characterised in that the gutter comprises an annular bottom wall having at least one discharge port, and in that the casing comprises at least one other port located on the outside of the gutter, said at least one other port and said at least one discharge port being connected to common discharge means.

The oil leaving the ports is thus guided efficiently towards the recovery gutter, which allows better recovery of the oil and prevents the spraying of any other elements present around the device with oil that has lubricated the device. In particular, when the device is confined in an enclosure, this prevents the oil from spraying an extensive region of the inner walls of the enclosure then splashing or flowing over other elements such as the bearings, seals or pipes of the oil separator.

Lastly, the fact that the casing comprises at least one other port located on the outside of the gutter, said at least one other port and said at least one discharge port being connected to common discharge means, which moreover is directly in the region of the casing, allows common use of the pumps for driving the oil recovered in the enclosure which comes from the rotating device and from other devices contained in the enclosure.

Advantageously, said at least one discharge port is located substantially at the lowest point of the gutter. The location of the discharge port in the gutter can therefore be configured so as to break the oil ring and allow the fluid to be recovered more easily.

By definition, the gutter comprises side walls surrounding a cylindrical surface which forms the bottom wall. Said bottom wall is placed opposite the oil streams leaving the ports of the cover in order to intercept said streams. The side walls allow the splashes from the oil stream hitting the bottom wall to be recovered in order to confine said oil in the gutter.

Advantageously, the casing comprises a radially inner face defining a wall of the lubrication enclosure and forming the bottom wall of the gutter. This simplifies the production of the module by avoiding the need to mount the gutter on a flange, for example, in order to bring said gutter closer to the cover.

Advantageously, the gutter comprises two annular side walls which move away from each other radially outwards.

The cross section of the gutter at the inlet for the oil ejected from the ports of the cover is therefore smaller than the surface area of the bottom wall that intercepts the oil stream. This limits the possibility of the oil splashes coming back out of the gutter, thus allowing better guiding of the oil ring rotating in the gutter so that said oil can then be discharged.

Each radial port of the cover may comprise a pipe, intended to form a means for guiding the oil.

The extension of the tubes outside the cover allows, among other things, the entrainment coefficient of the oil to be increased, up to a radius greater than that of the cover, as said oil comes out of the pipes. This then allows the circumferential speed of the oil to be increased and also allows the spread of the stream sprayed towards the wall of the enclosure to be reduced. Moreover, as this allows the outlet of the stream to be brought closer to the walls of the oil recovery enclosure, the size of the region where said oil must be recovered is reduced.

Preferably, the pipes extend radially outwards from the cover and slope in the same transverse plane and in the same direction about the axis of rotation.

Advantageously, in this case, the cover is configured so that the direction in which the pipes are oriented corresponds to the direction of rotation of the cover on the device in operation. Thus, the orientation of the pipes increases the tangential component of the oil sprayed onto an oil recovery wall. It can therefore form a rotating oil ring which will be guided more easily towards a discharge port.

Preferably, the transverse plane in which the pipes extend corresponds to the maximum radius of the annular casing.

The invention also relates to a turbine engine comprising such a module, device or cover.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood, and other details, features and advantages of the present invention will